

## **APPLE RESEARCH AT UNIVERSITY OF GUELPH, SIMCOE**

### **Contact Information**

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### **Program Overview**

The Horticultural Experiment Station, Simcoe, has 15 ha of orchard dedicated to apple research. Our research emphasizes solving practical cultural management problems using basic and applied science. Research concerns reflect the techniques required for growing modern intensive orchards planted with dwarfing rootstocks. Major thrusts include the evaluation of new cultivars for suitability under Ontario's soil and climatic regime, evaluation of dwarfing rootstocks on precocity, cropping efficiency, and tree vigour, and the performance of various cultivar/rootstock combinations in different intensive orchard systems. Efforts are also directed towards developing and testing new fruit thinning strategies. Soil management studies to evaluate the benefits of soil amendments recycled from agricultural sources on tree establishment, cropping, and soil sustainability and plant nutrition studies focusing on the improvement of fruit quality and yield have been more recently initiated.

### **Research Focus**

1. Cultivar and rootstock research and development - identify tree fruit cultivars and rootstocks with a range of ripening dates useful for fresh market production
2. Orchard Management Practices to Improve Production Efficiency, Profitability, and Fruit Quality
3. Tree Physiology and the Influence of Plant Growth Regulators (PGR) to Regulate Cropping, Improve Production Efficiency and Fruit Quality
4. Mineral Nutrition Effects on Fruit Quality and Tree Growth
5. Beneficial Use of Organic Amendments for reducing soil-borne disease and herbicides and improving fruit quality and plant health

**Cooperators:** AAFC (Vineland, Morden, Kentville, Summerland, Bouchtouche), Growers (Simcoe, London, G. Bay, Eastern Ontario, Niagara), Michigan State University, Cornell University, NC-140 USDA Technical Committee, NE-183 Technical Committee, OMAFRA and University of Guelph Colleagues

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### Experiment 1:

#### Regulation of flowering and fruiting with gibberellic acid sprays for minimizing bienniality

Planting Details: Jonagold/M.9 T337, Planted 1993, 4.5 x 2.0 m; 1111 trees/ha (14.5 x 6.6 ft; 4)50 trees/acre)

Objectives: To test the hypothesis that gibberellic acid sprays ( $GA_{4+7}$ ) can be used commercially to regulate cropping and reduce the need for chemical thinning

Grower Relevance: Improve annual bearing and optimize fruit size of biennial bearing cultivars

#### Experiment 2: Performance of inorganic and organic mulches on tree growth, productivity, and fruit quality

Planting Details: Royal Gala/M.9 T337 & Honeycrisp/M.26  
Planted 2000, 4.0 x 2.0 m; 1250 trees/ha (12.9 x 6.4 ft; 506 trees/acre)

Objectives: To test the hypothesis that orchard mulches can be used commercially to improve tree growth and yields with reduced herbicide and need for irrigation

Grower Relevance: Provide growers with sustainable cultural management techniques that improve production and fruit quality

#### Experiment 3: Performance of Apogee (Prohexadione-Ca) on the vegetative growth of McIntosh

Planting Details: McIntosh, Morspur/M.26, Planted 1983, 5.5 x 3.6 m; 498 trees/ha (17.7 x 11.8 ft; 201 trees/acre)

Objectives: To investigate the optimal rate and time of Apogee application

Grower Relevance: Apogee can be used as a management tool to reduce the need for summer and dormant pruning

#### Experiment 4: Cultural management of Honeycrisp

Planting Details: Honeycrisp/M.26, Planted 1999, 5.5 x 2.5 m; 727 trees/ha (17.7 x 8.0 ft; 294 trees/acre)

Objectives: To investigate the cultural management requirements of this new cultivar

Grower Relevance: Provide suitability and management information for growing Honeycrisp in Ontario

Experiment 5: Investigation of methods to improve the colour of ReTain treated fruit

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Planting Details: Royal Gala/M.9, Planted 1982, 5.5 x 2.2 m; 1010 trees/ha (14.5 x 7.1 ft; 409 trees/acre)

Objectives: To increase fruit colour in ReTain treated fruit

Grower Relevance: Enhance grower knowledge of the performance of ReTain on Gala, McIntosh and Empire

Experiment 6 A. Identify adaptable apple cultivars with a range of ripening dates useful for primarily fresh market production

B. Apple rootstock physiology - influence on precocity, vigour, winter hardiness, and resistance to fireblight.

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Planting Details: Approximately 155 Cultivars and 46 *Malus* rootstocks, Planted 1990-2000, various spacings and densities

Objectives: A. To provide objective information on the precocity, growth and performance of new apple cultivars

B. To develop the Vineland series rootstocks as well as provide information of the precocity, vigour, hardiness, and fireblight resistance of new promising apple rootstocks

Grower Relevance: Provide growers with local performance information on new size-controlling rootstocks. The long term goal is to provide a wider range of dwarfing vigour as well as improve productivity, disease and cold hardiness of M.9 and M.26.